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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/047,207

01/15/2002

Hong Wan

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06/17/2004

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EXAMINER

EASTHOM, KARL D

ART UNIT

PAPER NUMBER

2832

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/047,207	<b>Applicant(s)</b> WAN, HONG	
	<b>Examiner</b> Karl D Easthom	<b>Art Unit</b> 2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 11-12, and 31-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Torok et al. Torok discloses the claimed invention at Figs. 3a or 5, with first and second isolator input terminals 306, 308, or 510, first and second isolator output terminals 310, 312, or at V, first through fourth magnetoresistors 302, or 502-508, and wherein the resistors are each coupled to the claimed terminals, with supply B having two terminals, and an input strap 304 or 510 producing magnetic fields in opposite directions in two of the magnetoresistors as simple application of the right-hand rule shows, meeting claim 2. That is, a DC current entering at 510 would produce an upwards magnetic field at the top two magnetoresistors, and a downwards field for that below. In claims 3 and 12, the plurality is seen. In claims 4-5, some elongated portions at Fig. 5 of the magnetoresistors are from left to right, since elongated does not require that portion be the longest portion of the magnetoresistors. In claims 6 and 13, the input strap is in two different layers, each of which is different than the layer of the magnetoresistors. In claim 11, the strap is alongside four magnetoresistors in two different directions, where the sides are the top and bottom sides, and the current flows in opposite directions. In claim 31, the resistance in each changes so that there is tracking. In claims 32-33, the turns at the end run along a length where a length is the longest part, and run along a length at least at the ends.

3. Claims 1-17 and 32-35 are rejected under 35 U.S.C. 102(b) as anticipated by Wan Wan discloses the claimed invention at Fig. 1 where the input strap is 54, and the magnetoresistors are

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24-30. The supply terminals and isolator outputs are the terminals of the bridge of magnetoresistors. That is, while the input strap 54 is described as a reset strap, it still meets the claim since it can function as an input strap as it is isolated, and also produces fields in 28, 30 opposite from that of 24, 26. The elongated portions of claims 4-5 are at the top and bottom of Fig. 2. In claims 9-10, 16-17, and 34-35, the reset coil is the coil 72, 74 having the portions claimed. In claims 11 and 32-33, the first and second portions are the portions under the different magnetoresistors. They run along a length where a length is any finite portion. Or the portions of the coil 54 to the left and right of the magnetoresistors at Fig. 1 run along the length of those resistors if the length is taken to be the longest portions thereof. For claim 11, the two portions of at least one turn have current opposite in the different resistors 24 and 28, for example. Finally note that Fig. 1 of Wan is remarkably similar to Fig. 4 of applicant's specification. It appears that there are some structural differences between the input strap 54 of Wan and 70 of applicant, but applicant has the burden to explain the difference in terms of how the claims are not met by the input strap 54 of Wan. (Note too the discussion of Pant '590, where that "set/reset" strap is similar to that of Wan and isolates as noted.) For claim 31, [tracks] is a broad term, and the resistors each change to a maximum value when a pulse occurs due to the fields generated in the input coil so that there is a tracking. Since the setup is the same as that of applicant, there would appear to be tracking via a DC current also due to the vector sum of fields appearing. If this were not so, a pulse would not be required for setting/resetting. For claim 1 and 36, see also Fig. 1a, the semiconductor substrate is 100 with the input strap 60 (set/reset) above same, and dielectric 104, while the first and second

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magnetoresistors are on one side of the device, across the center, with the other two on the other side, so that the fields are generated toward the center and opposite as claimed.

4. Claims 1-5, 11-15, 31-33 and 36 are rejected under 35 U.S.C. 102(b) as anticipated by Pant '590. Pant discloses the claimed invention at Figs. 3a, 3b, and 3c where the input strap is 134, and the magnetoresistors are 120-123. The supply terminals and isolator outputs are the terminals of the bridge of magnetoresistors. The input strap 134 is as an input strap as it is isolated from the outputs of the magnetoresistors, and changes the transfer function and resistance of the resistors as noted at col. 3 so that the isolated output varies if a current is supplied, meeting claims 2 and 31. In claims 1-2 the fields are opposite as claimed, where "across" is a broad term. For claim 3, Fig. 5 discloses the strap under the magnetoresistors R1-R4. For claims 4-5 and 32-33, the elongated portions of the strap are near terminals S. In claims 6-8, and 12-15 see the dielectrics of SiN at Fig. 3c. For claim 1 and 36, the semiconductor is the Si with the input strap (set/reset) above same, and dielectric of SiN, the first and second magnetoresistors are on one side of the device, across the center, with the other two on the other side, so that the fields are generated toward the center and opposite as claimed

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7-10, 14-17, and 34-36 are rejected under 35 U.S.C. 103(a) as obvious over Torok et al. in view of Wan. Torok discloses the invention as noted above except for the dielectric and reset/straps. Wan discloses at col.1, lines 30-60, and Fig. 1 a set/reset strap 54, that is essential

in order for repeatability, and also for testing, setup, calibration, and compensation, meeting the claims, for magnetoresistors such as that of Torok at Fig. 5, so that it would have been obvious to employ the straps. Wan discloses dielectric layers 102, 104, and 106 at Fig. 1a for the purpose of providing small devices at col. 1 so that it would have been obvious to form such layers, where col. 4, lines 35-50 discloses varying relative locations of the layers so that such a variation employed with Torok would have been obvious.

7. Claims 7-8, 10, 17, 14-15, and 34-35 are rejected under 35 U.S.C. 103(a) as obvious over Torok et al. in view of Pant. ¶278. Torok discloses the invention as noted above except for the dielectric and set/reset strap. Pant discloses at Figs. 2-5 a set/reset strap and also dielectric layers, for testing, setup, calibration, and compensation, meeting the claims, for magnetoresistors such as that of Torok at Fig. 5, so that it would have been obvious to employ the straps. That is, Pant discloses at col. 1 that such testing, calibration was in the past done by coils, which would be required by the Torok device, so that it would have been obvious to employ buried coils in dielectric layers to form a compact self-contained device as stated at col. 1 (see the bottom thereof).

8. Applicant's arguments filed 4/20/04 have been considered but are not persuasive. Applicant argues that Torok does not disclose the claimed relationship along first and second GMR films, but does along other numbered magnetoresistors. Applicant assigns "first" and "second" in a fashion to avoid the art but this does not appear helpful since any one of the resistors can be called, first, second, etc., where all are "coupled" to the various inputs argued. As to claim 11, the "portions" are as claimed. Applicant argues that a "portion of the input strap can be only by the first and second magnetoresistors, however, only a portion of each strap as

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disclosed by Torok runs along a particular magnetoresistor, as claimed, regardless of what the remaining portions of the Torok strap do, such that what the remaining portions do are not germane to an open ended claim. It also runs alongside where the term is broad and the strap is along the sides.

9. Applicant argues, and provides a declaration with similar argument, that the set/reset strap 54 of Wan cannot function as an input isolator. Both ignore the central issue - the broad definition of isolator given by the Examiner. There is no question that some signal at the input will produce some signal at the output. To wit, Wan at col. 3, lines 28-45, states "[w]ith a current entering pad 56 and leaving at pad 58, the current in segments 60 will cause a magnetization in elements 28 and 30 towards a central part of die 20. When a current is reversed ... [the field is reversed]". This is an isolator. Applicant states it is not a "useful" isolator. This of course depends on the term "useful", and is tantamount to another admission that it is an isolator. A current change in the input [set/reset strap 54 of Wan] changes the field in the magnetoresistors, thereby changing the bridge output. That is why the strap is there, to change or null the bridge output offset. This part is agreed upon. Any such strap is an isolator in the broad sense of the term. This is also evidenced by the '278 patent to Pant as (acknowledged by applicant as cited by Wan at col. 1) at the top col. 5, whereat there are measurements produced at the output pads 26, 30 for example as a result of inputs to the set/reset strap. Also, as noted above, Pant '590 reveals that the set/reset (input) straps do alter the transfer function, meeting the claim. Applicant and his declarant pointedly ignore the discussion of Pant '590 as it relates to similar structure as to Wan, where that "set/reset" strap is similar to that of Wan and isolates as noted. As to the '278 patent, applicant agrees that an offset is

eliminated. That elimination is an output. Simply put, without a current, there is a different output than with one at the set reset/ input straps, meeting the claims. The Declaration provides no factual support otherwise. Primarily, it pointedly ignores the statements by the Examiner and evidence in Wan that a current at the set/reset strap, provides an output in the bridge, that is different than would otherwise appear without the field. Thus, a DC signal or pulse, which resets the resistors in the insensitive direction as stated in the Declaration, creates a different resistance in the magnetoresistors that is a direct result of the DC signal or pulse, thus isolating the signal in the manner claimed. This would be useful to isolate a DC signal or pulse from the bridge circuit. Applicant's declarant has not addressed this contention, nor has applicant's representative, other than to state it is not useful. Perhaps the set/reset strap of Wan cannot do what the input strap as disclosed by applicant can do, but such is not claimed, and applicant addresses not what is broadly claimed. The declarant's statement is taken to mean that the Wan device cannot function as an isolator as he defines it, but not as broadly defined. That is, isolator is a broad term, and the declarant fails to address the broad interpretation by the Examiner. Moreover, evidence in Wan and Pant indicate that there are two separate bridge outputs for two opposite DC inputs to the set/reset strap of Wan (input strap of the claim), as noted above, which would indicate a very useful isolator. This too must be addressed. Applicant also fails to point to any structural difference between the input strap of the claim and the strap 54 of Wan, instead now claiming opposite fields in two of the four magnetoresistors. Of course, this function creates no structural distinction. As noted in Wan, the fields in two of the magnetoresistors are in the opposite directions – toward the center of the device, directly contrary to applicant's stated assertions otherwise (see also the remarks below as to Pant). As



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to claim 11, and Wan and Pant, note the response above, “alongside” and “portions” create ample broad room to read the limitations on the devices of the prior art. Further, as to Pant, “coupled” is a broad term, and all resistors are coupled to the various inputs argued. In claim 36, the first and second magnetoresistors are on one side of the device, across the center, with the other two on the other side, so that the fields are generated toward the center and opposite as claimed

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl D Easthom whose telephone number is (571) 272-1989. The examiner can normally be reached on M-Th, 5:30AM-4:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Karl D Easthom  
Primary Examiner  
Art Unit 2832

KDE